ACOUSTICAL SITE ASSESSMENT
RAMONA BRANCH LIBRARY DEVELOPMENT SITE
SAN DIEGO COUNTY, CA

Submitted to:

Sophia Habl Mitchell
Environmental Project Manager
HDR
8690 Balboa Avenue, Suite 200
San Diego, CA 92123

Prepared by:

Investigative Science and Engineering, Inc.
Scientific, Environmental, and Forensic Consultants

P.O. Box 488 / 1134 D Street
Ramona, CA 92065
(760) 787-0016
www.ise.us

ISE Project #09-005

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INTRODUCTION AND DEFINITIONS

Existing Site Characterization

The subject property consists of approximately 7.32 acres within the downtown district of Ramona, California (refer to Figure 1 on the following page). Specifically, the project site is fronted by State Route 67 (SR 67) on the northwest corner of 13th and Main Street (SR 67). Access to the site is obtained via Main Street (SR 67) as can be seen in Figure 2 on Page 3 of this report.

The development site currently exists as a vacant previously disturbed lot as can be seen in Figure 3 on Page 4 of this report. The mean topography of the site is approximately 1,420 feet above mean sea level (MSL).

Project Description

The County of San Diego Department of General Services proposes to develop a new branch library in downtown Ramona on the northwest corner of 13th and Main Street. The library building will front Main Street and have a total footprint of approximately 21,000 square-feet (19,500 square feet of net usable space) as can be seen in Figure 4 on Page 5 of this report.

The rear of the proposed library structure will be a parking lot with 65 parking spaces, including three designated for handicapped parking. Vehicular access to the site is anticipated via a driveway off of 13th Street. The Ramona Library project will also include associated facilities such as landscaping and, potentially, internal walkways as well as a sidewalk and pedestrian entrance to the site along Main Street.

Although the current project site is 7.32 acres in size, only a portion of the site is dedicated to the library and the remainder will be rough graded for future development of public uses that will compliment the library facility. Future facilities may include a senior center or other healthcare or recreational facilities.

Acoustical Definitions

Sound waves are linear mechanical waves. They can be propagated in solids, liquids, and gases. The material transmitting such a wave oscillates in the direction of propagation of the wave itself. Sound waves originate from a vibrating surface. Whether this surface is the vibrating string of a violin or a person's vocal cords, a vibrating column of air from an organ or clarinet, or a vibrating panel from a loudspeaker, drum, or aircraft, the sound waves generated are all similar. All of these vibrating elements alternatively compress the surrounding air on a forward movement, and expand it on a backward movement.

There is a large range of frequencies within which linear waves can be generated, sound waves being confined to the frequency range that can stimulate the auditory organs to the sensation of hearing. For humans this range is from about 20 Hertz (Hz or cycles per second) to about 20,000 Hz. The air transmits these frequency disturbances outward from the source of the wave.

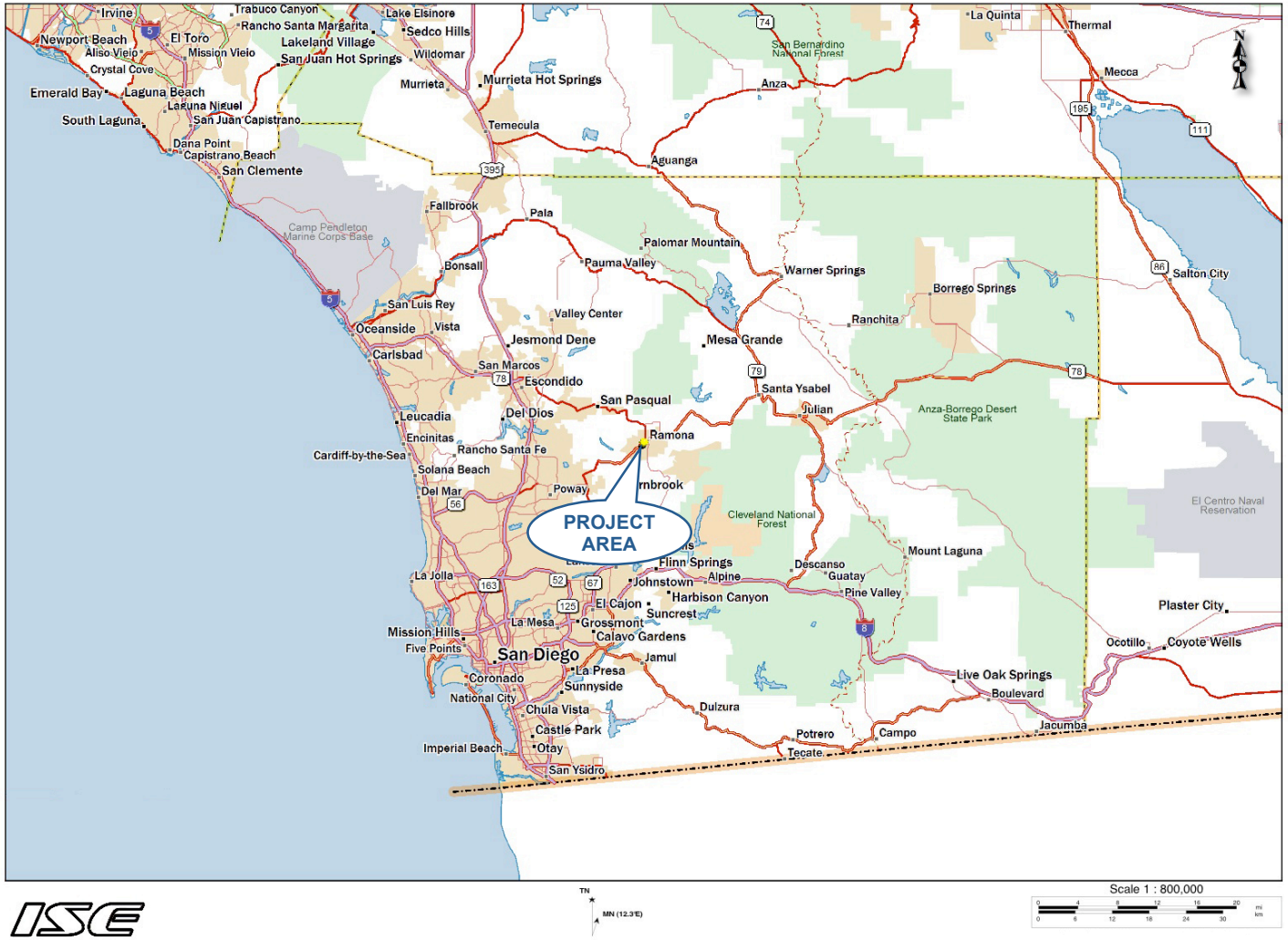

FIGURE 1: Project Vicinity Map (ISE 6/09)

FIGURE 2: Project Site Location Map and Property Boundary Extents (ISE 6/09)

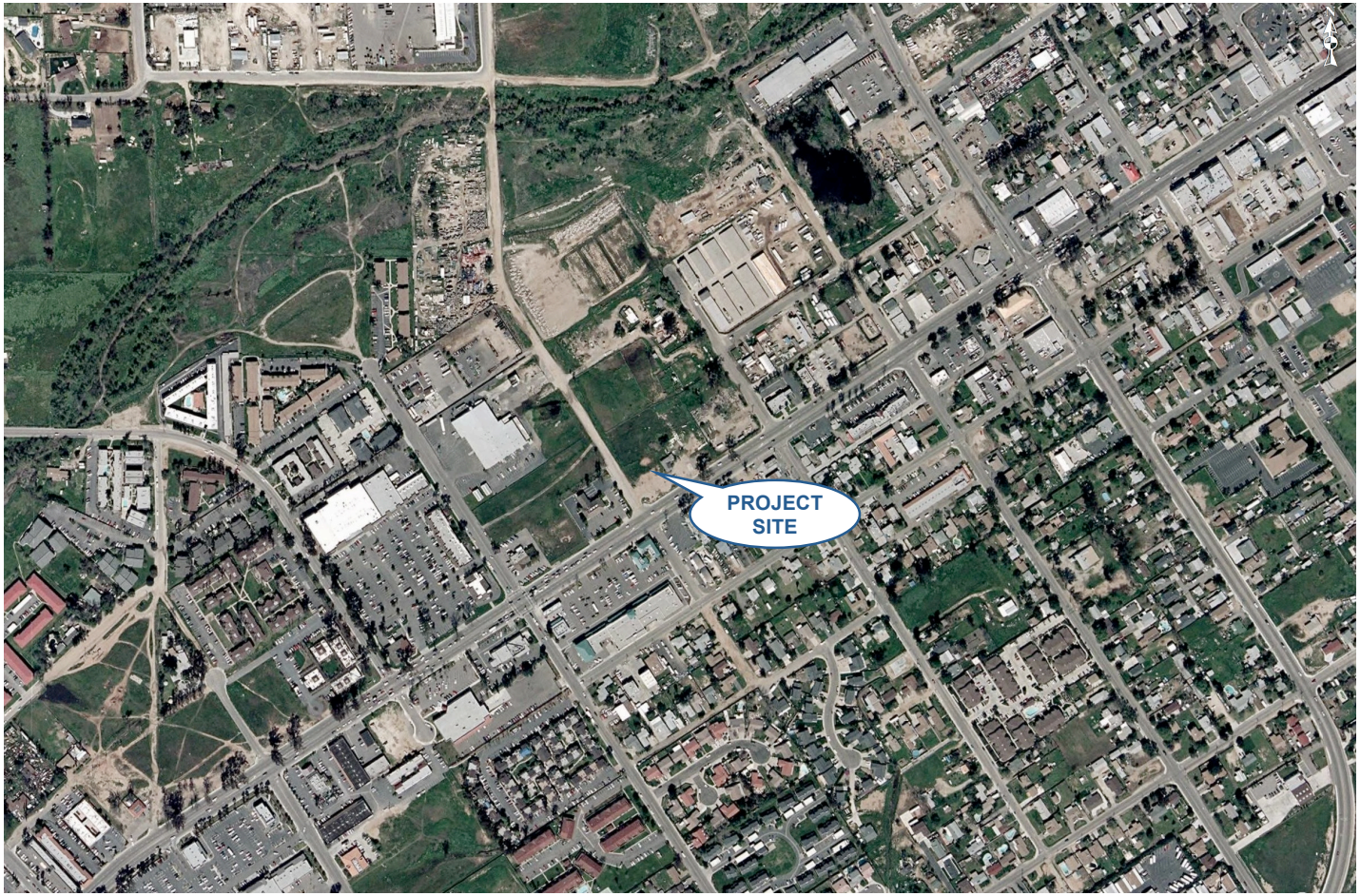

FIGURE 3: Project Site Aerial Photograph (Google Earth 6/09)

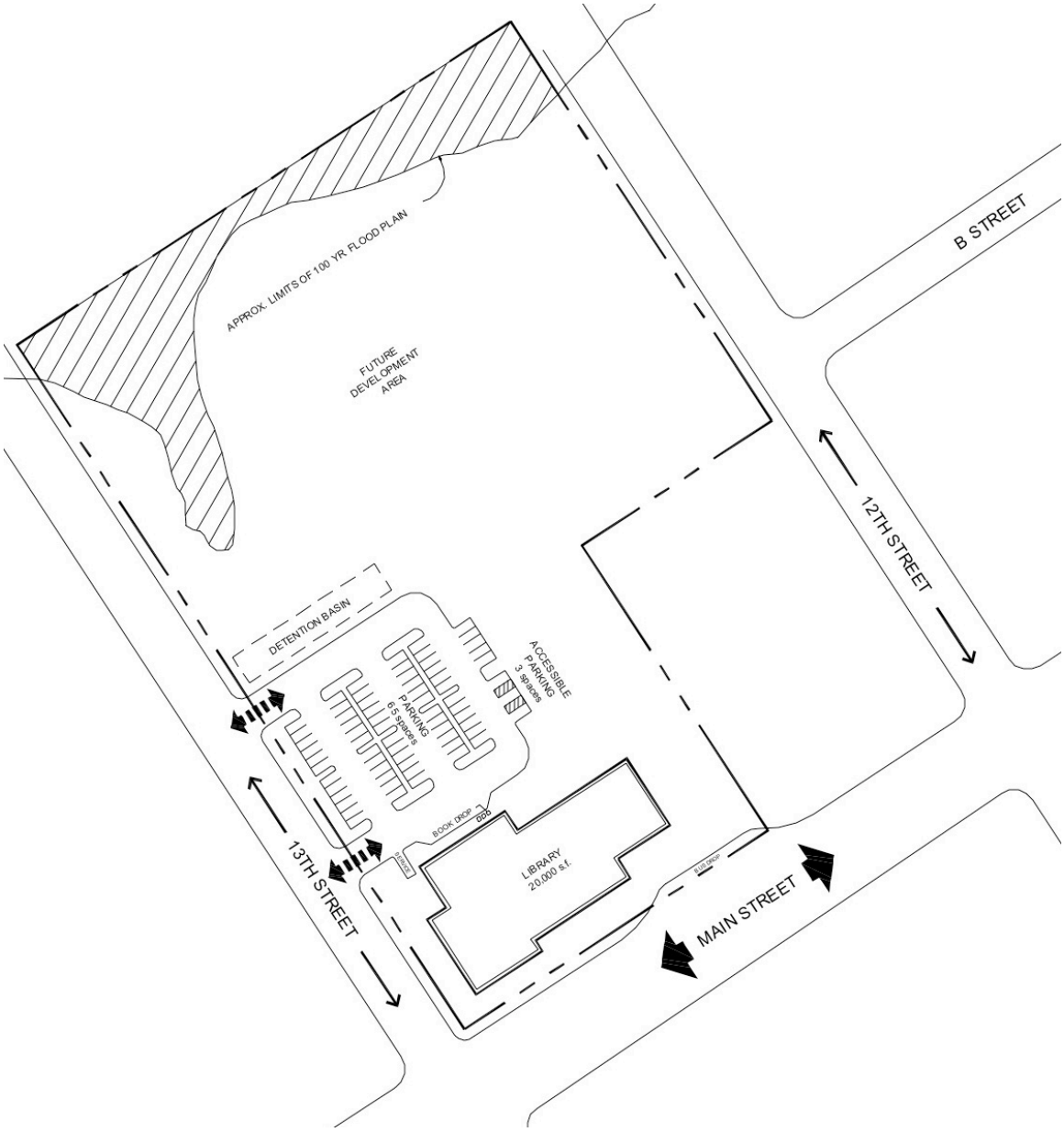

FIGURE 4: Proposed Ramona Branch Library Development Plan (HDR 5/09)

Sound waves, if unimpeded, will spread out in all directions from a source. Upon entering the auditory organs, these waves produce the sensation of sound. Waveforms that are approximately periodic, or consist of a small number of periodic components, can give rise to a pleasant sensation (assuming the intensity is not too high), as in a musical composition.

Noise, on the other hand, can be represented as a superposition of periodic waves with a large number of components, and is generally defined as unwanted or annoying sound that is typically associated with human activity and which interferes with, or disrupts, normal activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day, and the sensitivity of the individual hearing the sound.

Airborne sound is a rapid fluctuation of air pressure above and below atmospheric levels. The loudest sounds that the human ear can hear comfortably are approximately one trillion (or $1x10^{12}$) times the acoustic energy that the ear can barely detect. Because of this vast range, any attempt to represent the acoustic intensity of a particular sound on a linear scale becomes unwieldy. As a result, a logarithmic ratio, originally conceived for radio work, known as the decibel (dB) is commonly employed. [1,2]

The minimum change in sound level that the human ear can detect is approximately 3.0 dBA.[3] A change in sound level of 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness[4]. A change in sound level of 10 dB actually represents an approximate 90 percent change in the sound intensity, but only about a 50 percent change in the perceived loudness. This is due to the nonlinear response of the human ear to sound.

As previously mentioned, most of the sounds we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies differing in sound level. The intensities of each frequency add to generate the sound we hear. The method commonly used to quantify environmental sounds consists of determining all of the frequencies of a sound according to a weighting system that reflects the nonlinear

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[1] A decibel (dB) is a unit used to express the intensity of a sound wave. This level is defined as being equal to 20 times the common logarithm of the ratio of the pressure, produced by a sound wave of interest, to a 'reference' pressure wave (which is defined as 1 micro Pascal measured at a distance of 1 meter).

[2] A sound level of zero "0" dB is scaled such that it is defined as the threshold of human hearing, and would be barely audible to a human of normal hearing under extremely quiet listening conditions. Such conditions can only be generated in anechoic chambers or "dead rooms". Typically, the quietest environmental conditions (extreme rural areas with extensive shielding) yield sound levels of approximately 20 decibels. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB roughly correspond to the threshold of pain.

[3] Every 3 dB equates to a 50% of drop (or increase) in wave strength; therefore a 6 dB drop/increase = a loss/increase of 75% of total signal strength and so on.

[4] This is a subjective reference based upon the nonlinear nature of the human ear.

response characteristics of the human ear. This is called "A" weighting, and the decibel level measured is called the A-weighted sound level (or dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of sounds from distant sources that create a relatively steady background noise in which no particular source is identifiable. For this type of noise, a single descriptor called the Leq (or equivalent sound level) is used. Leq is the energy-mean A-weighted sound level during a measured time interval. It is the 'equivalent' constant sound level that would have to be produced by a given source to equal the average of the fluctuating level measured. For most acoustical studies, the monitoring interval is generally taken as one-hour, and is abbreviated *Leq-h*.

To describe the time-varying character of environmental noise, the statistical noise descriptors L10, L50, and L90 are commonly used. They are the noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of a stated time. Sound levels associated with the L10 typically describe transient or short-term events, while levels associated with the L90 describe the steady state (or most prevalent) noise conditions. In addition, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the maximum and minimum measured sound level (Lmax and Lmin) indicators. The Lmin value obtained for a particular monitoring location is often called the *acoustic floor* for that location.

Finally, another sound measure employed by the State of California and the County of San Diego is known as the Community Noise Equivalence Level (CNEL) is defined as the "A" weighted average sound level for a 24-hour day. It is calculated by adding a 5-decibel penalty to sound levels in the evening (7:00 p.m. to 10:00 p.m.), and a 10-decibel penalty to sound levels in the night (10:00 p.m. to 7:00 a.m.) to compensate for the increased sensitivity to noise during the quieter evening and nighttime hours.

SIGNIFICANCE THRESHOLDS

California Environmental Quality Act (CEQA) Thresholds

Section 15382 of the California Environmental Quality Act (CEQA) guidelines defines a significant impact as,

> *"… a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance."*

The minimum change in sound level that the human ear can detect is approximately 3-dBA. This increment, 3-dBA, is commonly accepted under CEQA as representing the point where a noise level increase would represent a significant impact. This impact threshold is accepted by the County of San Diego and will be used as the

significance threshold to determine the project's impact on the affected (existing) environment.

County of San Diego Construction Noise Ordinance

Noise generated by construction activities related to the project should not exceed the standards listed in San Diego County Code Section 36.410, which states the following:

Except for emergency work,

(a) It shall be unlawful for any person to operate construction equipment between the hours of 7 p.m. of any day and 7 a.m. of the following day.

(b) It shall also be unlawful for any person to operate construction equipment on Sundays, and days appointed by the President, Governor, or the Board of Supervisors for a public fast, Thanksgiving, or holiday, but a person may operate construction equipment on the above-specified days between the hours of 10 a.m. and 5 p.m. at his residence or for the purpose of constructing a residence for himself, provided that the average sound level does not exceed 75 decibels during the period of operation and that the operation of construction equipment is not carried out for profit or livelihood.

(c) It shall also be unlawful to operate any construction equipment so as to cause at or beyond the property line of any property upon which a legal dwelling unit is located an average sound level greater than 75 decibels between the hours of 7 a.m. and 7 p.m.

Thus, the applicable construction noise standard would be 75 decibels average at any residential property line within proximity of the project site between the hours of 7 a.m. and 7 p.m.

County of San Diego Operational Noise Standards

The San Diego County Noise Ordinance Section 36.404 governs fixed source and/or operational noise. The applicable sound levels are a function of the time of day and the land use zone. Sound levels are measured at the boundary of the property containing the noise source. The relevant limits are shown in Table 1 on the following page.

In the case where two adjacent property lines differ in zoning, the applicable threshold would be the arithmetic average of the two standards. If the ambient sound levels were consistently higher than zonal property line standards, then the ambient conditions would be the property line standard. This standard would be applied during all hours of operation.

TABLE 1: County of San Diego Noise Ordinance Limits

Land Use Zone	Time of Day	1-Hour Average Sound Level (dBA Leq)
R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-87, S-88, S-90, S-92, R-V, and R-U	7 am to 10 pm 10 pm to 7 am	50 45
R-R0, R-C, R-M, C-30, and S-86	7 am to 10 pm 10 pm to 7 am	55 50
S-94 and other commercial zones	**7 am to 10 pm** **10 pm to 7 am**	**60** **55**
M-50, M-52, and M-54	any time	70
S-82 and M-58	any time	70

Source: County of San Diego Noise Ordinance Section 36.404, 1981.

The proposed Ramona Branch Library development site is zoned C-36 (General Commercial) with all surrounding uses having a similar commercial classification as can be seen in Figure 5 on the following page. The standard for this zoning would be a one-hour average sound level of 60 dBA between the hours of 7 a.m. and 10 p.m., and a one-hour average sound level of 55 dBA between the hours of 10 p.m. and 7 a.m.

FIGURE 5: Property Zoning Map within Project Vicinity (ISE 6/09)

ANALYSIS METHODOLOGY

Existing Conditions / Baseline Calibration Survey

A single monitoring location within the project site, in an area anticipated to be representative of the noise impact potential from traffic, the dominant noise source to this site, was selected for the purposes of determining the ambient baseline noise and site conditions. The position of this monitoring point, Monitoring Location ML 1 (denoted by the designator ①), is shown in Figures 6a and -b below, and was taken on the project site in the vicinity of the intersection of 13th Street and Main Street, on June 16, 2009 beginning at 4:45 p.m. during normal community acoustical conditions.

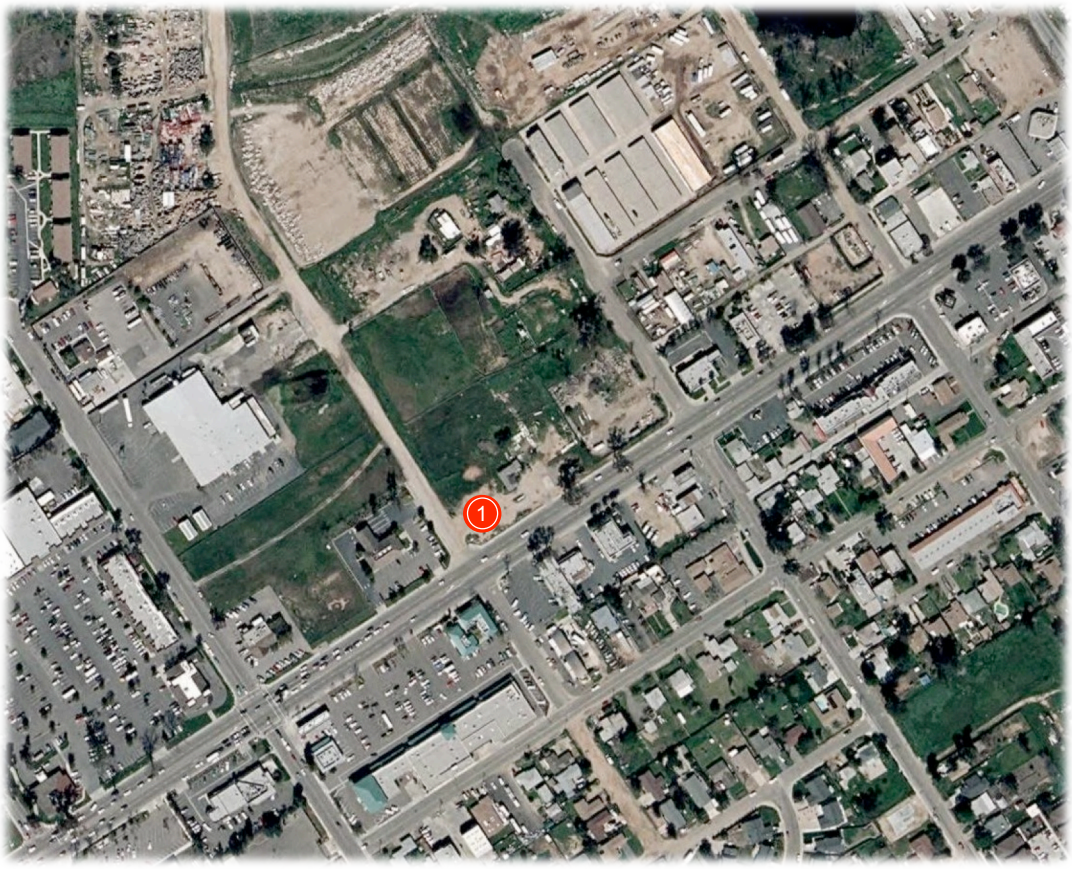

FIGURE 6a: Onsite Community Noise Monitoring Location (ISE 6/09)

FIGURE 6b: Existing Ambient Onsite Monitoring Location 1 – Ramona Branch Library Site (ISE 6/09)

For the field monitoring effort, a Quest SoundPro SP-DL-2 ANSI Type 2 integrating sound level meter was used for data collection. The meter was affixed to a tripod five-feet above ground level, in order to simulate the noise exposure of an average-height human being. Prior to testing, all equipment was calibrated at ISE's acoustics and vibration laboratory to verify conformance with ANSI S1-4 1983 Type 2 and IEC 651 Type 2 standards.

Construction Noise Impact Assessment Approach

Major construction noise emission generators would consist primarily of activities associated with site, including remedial grading activities for parking lot areas and the library building pad, concrete deliveries, pavers, and contractor vehicles.

Construction noise present at the project site was based upon past measured levels and sources from *EPA PB 206717* of each expected equipment type, the duty cycle of each of the equipment components, and the expected average noise level (over a given workday), as well as the expected worst-case noise level at the nearest sensitive receptor.[5] Cumulative (i.e., worst case aggregate) levels were calculated for a range of expected worst-case noise emissions from proposed equipment at the closest sensitive receptors, per the requirements of Section 36.410 of the County's construction ordinance.

Future Onsite Noise Modeling Approach

Dominant proposed onsite noise sources, consisting entirely of HVAC climate control systems, were modeled using the ISE *Industrial Source Model* (*IS*^{3}) *v4.0*.[6] The IS^3 model calculates the predicted acoustic field pattern using a vector-based summation of all source-receptor pairs. The resulting output consists of an isogram containing the predicted acoustic field, accounting for refraction and structural attenuation. The modeled geometric definition points as well as anticipated noise source areas are shown graphically in Figure 7 on the following page.

The colored dots are grouped according to building and/or source point, in no specific order. Modeled noise sources (such as the blue dots within the roofline of the proposed library structure) represent discrete 5-ton central HVAC units with a radiative source level of 75 dBA at 3.0-feet from the source. Modeled geometry points, such as the red corner points of structures, define the physical boundaries of the structure, the walls being literally the line segments between the dots. Predicted levels were examined for consistency with the applicable property line standards, identified previously in Table 1 (i.e. 60 dBA Leq-h). Sources found to exceed the applicable standards would be further examined for appropriate mitigation measures.

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[5] Source: Environmental Protection Agency, 12/31/71, "Noise from Construction Equipment and Operations".

[6] The ISE *Industrial Source Model* (*IS*^{3}) *v4.0* provides a visual representation of an acoustic field pattern across any three-dimensional surface, factoring in the effects of topographic and structural interference, apparent receptor elevation, static reflection from objects, multiple material attenuative sources, variable propagation rates and source types, and atmospheric scattering.

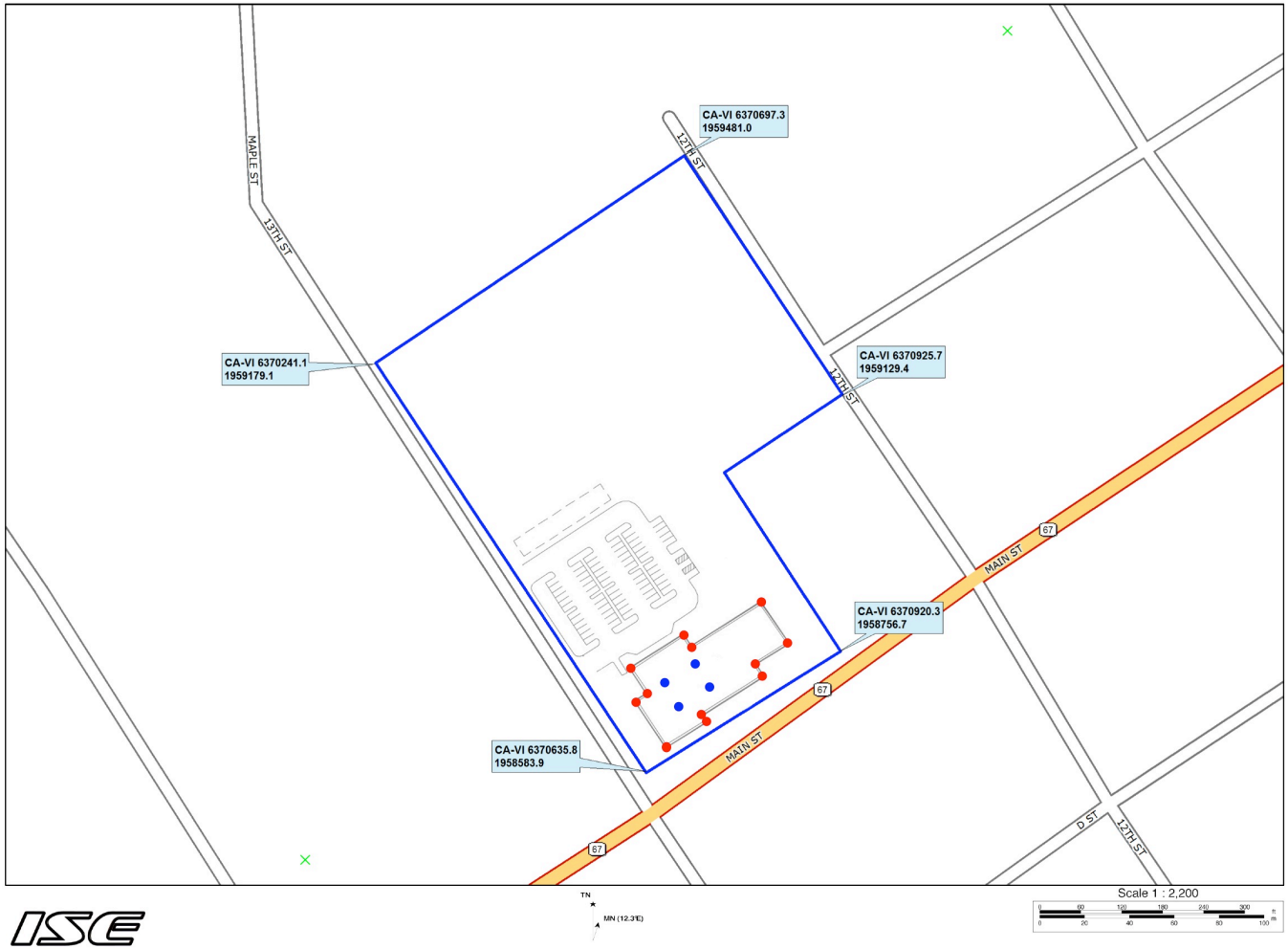

FIGURE 7: IS³ Modeled Geometry/Receptor Locations within Project Site (ISE 6/09)

Traffic Segment Impact Assessment Approach

The ISE *RoadNoise v2.1* traffic noise prediction model, which is based upon Caltrans Sound 32 Traffic Noise Prediction Model with California (CALVENO) noise emission factors (based on FHWA RD-77-108 and FHWA/CA/TL-87/03 standards), was used to calculate the increase in vehicular traffic noise levels along major servicing roadways due to the proposed development project plan.[7] The model assumed a 'hard-site' propagation rule (i.e., 3.0 dBA loss per doubling of distance (DD) between source and receiver), thereby yielding a representative worst-case noise contour set.

FINDINGS AND RECOMMENDATIONS

Ambient Sound Measurement Results

Testing during the monitoring period was performed under a daytime condition, with little or no appreciable wind, an approximate mean temperature of 82.0 degrees Fahrenheit, and relative humidity of 44%. The results of the sound level monitoring are shown in Table 2 below. The values for the equivalent sound level (Leq-h), the maximum and minimum measured sound levels (Lmax and Lmin), and the statistical indicators L10, L50, and L90, are given for this monitoring location.

TABLE 2: Measured Ambient Sound Levels – Ramona Branch Library Project Site

		1-Hour Noise Level Descriptors in dBA					
Monitoring Location	**Start Time**	**Leq**	**Lmax**	**Lmin**	**L10**	**L50**	**L90**
1	4:45 p.m.	62.8	78.0	49.4	65.2	60.3	55.4

Monitoring Locations:

Location 1: Ramona Library Site, in vicinity of the intersection of 13th Street and Main Street
GPS: N33 02.381 x W116 52.397, EPE 13 ft, Temp 82.0 °F, RH 44%

Measurements performed by ISE on 6/16/09. EPE = Estimated Position Error.

Measurements collected on the site reflect the ambient sound levels at the boundary of the project site. As shown above, the hourly average sound level (or Leq-h) recorded over the monitoring period was found to be 62.8 dBA. The acoustic floor for the site, as seen by the Lmin indicator, was found to be 49.4 dBA. The dominant observed noise source was found to be an aggregate of surface street traffic noise, and general noise from the surrounding community.

[7] Source: Source: *Traffic Impact Analysis – Ramona Library, Ramona, CA – Linscott, Law & Greenspan, 5/14/09.*

Construction Noise Emission Levels

The estimated construction equipment noise emissions are provided in Table 3, starting below, for the anticipated construction grading operations, lot leveling, and driveway and finish surfacing. This would typically consist of two distinct phases, as shown.

TABLE 3: Predicted Construction Noise Levels – Ramona Branch Library

Equipment Type	Qty. Used	Duty Cycle (Hrs. / day)	Source Level @ 50 Feet (dBA)	Cumulative Effect @ 50 Feet (dBA Leq-12h)
Phase 1: Lot Grading / Pad Preparation				
Bulldozer w/ Drawbar	1	4	75	70.2
Loader	1	4	70	65.2
Water Tank Truck	1	4	70	65.2
Dump Truck	1	4	70	65.2
			Worst-Case Aggregate Sum @ 50 Ft. (Σ):	73.1
			Sum @ Closest Receptor Area (Σ):	**67.1**
Phase 2: Building Construction / Parking Lot Paving and Finishing				
Backhoe	1	3	75	69.0
Loader	1	3	70	64.0
Paver	1	4	75	70.2
Concrete Truck	8	0.5	75	70.2
Dump Truck	5	0.5	75	68.2
			Worst-Case Aggregate Sum @ 50 Ft. (Σ):	75.8
			Sum @ Closest Receptor Area (Σ):	**69.8**

Source: EPA PB 206717, Environmental Protection Agency, 12/31/71, "Noise from Construction Equipment and Operations"

Construction within the proposed project area would typically occur between the hours of 7 a.m. and 7 p.m. Monday through Friday in accordance with County operational requirements. The nearest sensitive receptor, with the respect to the closest construction activities, would be at least 100-feet distant on average. Noise levels predicted under this condition could be as high as 69.8 dBA Leq-12h, assuming all activities occurred in a single condensed area (a highly unlikely, but worst-case condition). Based upon these predictions construction noise impacts are not expected and would not require mitigation.

Expected Operational Noise Impacts

The results of the IS^3 computer modeling are provided in Figure 8, on the following page, for the currently proposed design. The colored contours represent areas of equal noise exposure within the project site and surrounding properties, and are a composite of the approximate 125,000 data points generated by the computer model. This model included the effects of the proposed library structure, which was assumed to house the rooftop HVAC units within a three-foot-high parapet per County design guidelines. The IS^3 model input and output results are provided as an attachment to this report.

Based upon these findings, full utilization of the project site, inclusive of all HVAC equipment running continuously and simultaneously, was found to produce worst-case property line sound levels of approximately 25 dBA Leq-h[8], which would comply with the County Noise Ordinance with a requisite margin.

It should further be noted that since the ambient community sound levels at the project site are greater than this projected level, the audibility of these units is anticipated to be negligible (i.e., the average level would merge as a din into the background noise produced by neighboring commercial uses and surface street traffic noise along SR-67). Given this, no remedial mitigation in the form of additional exterior noise walls or barriers would be required as a result of this project.

[8] As measured at the curb line as shown in Figure 8.

FIGURE 8: IS³ Modeled Output – Operational Noise Due to Potential HVAC Operation (ISE 6/09)

Future Traffic Noise Impacts

The results showing the effect of traffic noise increases on the various servicing roadway segments associated with the proposed Ramona Branch Library development project are presented in Tables 4a through –e, below, for the following scenarios:

Table 4a)	Existing Traffic Conditions
Table 4b)	Nearterm Scenario A
Table 4c)	Nearterm Scenario B
Table 4d)	Nearterm Scenario C
Table 4e)	Nearterm Scenario D
Table 4f)	Project Traffic Noise Increases

For each roadway segment examined, the worst case average daily traffic volume (ADT) and observed/predicted speeds are shown along with the corresponding reference noise level at 50-feet (in dBA). Additionally, the line-of-sight distance to the 60 and 65 dBA CNEL contours from the roadway centerline are provided as an indication of the worst-case unobstructed theoretical traffic noise contour placement.

TABLE 4a: Existing Traffic Conditions

Roadway Segment	ADT	Speed (MPH)	SPL	CNEL Contour Distances (feet) 75 CNEL	70 CNEL	65 CNEL	60 CNEL
State Route 67 (SR 67)							
West of 13th Street	30,000	40	73.1	32	101	320	1,012
East of 13th Street	30,500	40	73.1	33	103	325	1,029

Notes:
- ADT = Average Daily Trips – Source: Linscott, Law & Greenspan, 5/14/09.
- SPL = Sound Pressure Level in dBA at 50-feet from the road edge. CNEL = Community Noise Equivalent Level.
- All values given in dBA CNEL. Contours assumed to be line-of-sight perpendicular (⊥) distance.

TABLE 4b: Nearterm Scenario A

Roadway Segment	ADT	Speed (MPH)	SPL	CNEL Contour Distances (feet) 75 CNEL	70 CNEL	65 CNEL	60 CNEL
State Route 67 (SR 67)							
West of 13th Street	30,330	40	73.1	32	102	324	1,023
East of 13th Street	31,120	40	73.2	33	105	332	1,050

Notes:
- ADT = Average Daily Trips – Source: Linscott, Law & Greenspan, 5/14/09.
- SPL = Sound Pressure Level in dBA at 50-feet from the road edge. CNEL = Community Noise Equivalent Level.
- All values given in dBA CNEL. Contours assumed to be line-of-sight perpendicular (⊥) distance.

TABLE 4c: Nearterm Scenario B

Roadway Segment	ADT	Speed (MPH)	SPL	CNEL Contour Distances (feet)			
				75 CNEL	70 CNEL	65 CNEL	60 CNEL
State Route 67 (SR 67)							
West of 13th Street	28,300	40	72.8	30	95	302	955
East of 13th Street	28,920	40	72.9	31	98	308	976

Notes:

- ADT = Average Daily Trips – Source: Linscott, Law & Greenspan, 5/14/09.
- SPL = Sound Pressure Level in dBA at 50-feet from the road edge. CNEL = Community Noise Equivalent Level.
- All values given in dBA CNEL. Contours assumed to be line-of-sight perpendicular (⊥) distance.

TABLE 4d: Nearterm Scenario C

Roadway Segment	ADT	Speed (MPH)	SPL	CNEL Contour Distances (feet)			
				75 CNEL	70 CNEL	65 CNEL	60 CNEL
State Route 67 (SR 67)							
West of 13th Street	28,280	40	72.8	30	95	302	954
East of 13th Street	28,900	40	72.9	31	97	308	975

Notes:

- ADT = Average Daily Trips – Source: Linscott, Law & Greenspan, 5/14/09.
- SPL = Sound Pressure Level in dBA at 50-feet from the road edge. CNEL = Community Noise Equivalent Level.
- All values given in dBA CNEL. Contours assumed to be line-of-sight perpendicular (⊥) distance.

TABLE 4e: Nearterm Scenario D

Roadway Segment	ADT	Speed (MPH)	SPL	CNEL Contour Distances (feet)			
				75 CNEL	70 CNEL	65 CNEL	60 CNEL
State Route 67 (SR 67)							
West of 13th Street	27,270	40	72.6	29	92	291	920
East of 13th Street	27,890	40	72.7	30	94	298	941

Notes:

- ADT = Average Daily Trips – Source: Linscott, Law & Greenspan, 5/14/09.
- SPL = Sound Pressure Level in dBA at 50-feet from the road edge. CNEL = Community Noise Equivalent Level.
- All values given in dBA CNEL. Contours assumed to be line-of-sight perpendicular (⊥) distance.

TABLE 4f: Project Traffic Noise Increases

Roadway Segment	Existing Conditions	Scenario A Conditions	Scenario B Conditions	Scenario C Conditions	Scenario D Conditions	Maximum Project Related Difference (SPL)
State Route 67 (SR 67)						
West of 13th Street	73.1	73.1	72.8	72.8	72.6	0.0
East of 13th Street	73.1	73.2	72.9	72.9	72.7	0.1

Notes:

- SPL = Sound Pressure Level in dBA at 50-feet from the road edge. CNEL = Community Noise Exposure Level.
- All values given in dBA CNEL. Contours assumed to be line-of-sight perpendicular (⊥) distance.

As can be seen from the traffic data, the largest increase in traffic noise would be 0.1 dBA CNEL occurring under Scenario A. All other scenarios produced levels either at, or below zero. Therefore, no project related traffic noise impacts are expected.

CONCLUSIONS

No construction, operational, or traffic-related noise impacts were associated with the proposed Ramona Branch Library project. Based upon these findings, no mitigation is identified.

CERTIFICATION OF ACCURACY AND QUALIFICATIONS

This report was prepared by Investigative Science and Engineering, Inc. (ISE), located at 1134 D Street, Ramona, CA 92065. The members of its professional staff contributing to the report are listed below:

Rick Tavares *(rtavares@ise.us)*	Ph.D. Civil Engineering M.S. Structural Engineering M.S. Mechanical Engineering B.S. Aerospace Engineering / Engineering Mechanics
Karen Tavares *(ktavares@ise.us)*	B.S. Electrical Engineering

ISE affirms to the best of its knowledge and belief that the statements and information contained herein are in all respects true and correct as of the date of this report. Should the reader have any questions regarding the findings and conclusions presented in this report, please do not hesitate to contact ISE at (760) 787-0016.

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Approved as to Form and Content:

Rick Tavares, Ph.D.
Project Principal
Investigative Science and Engineering, Inc.

APPENDICES / SUPPLEMENTAL INFORMATION

ISE IS^3 4.0 Input/Output Results

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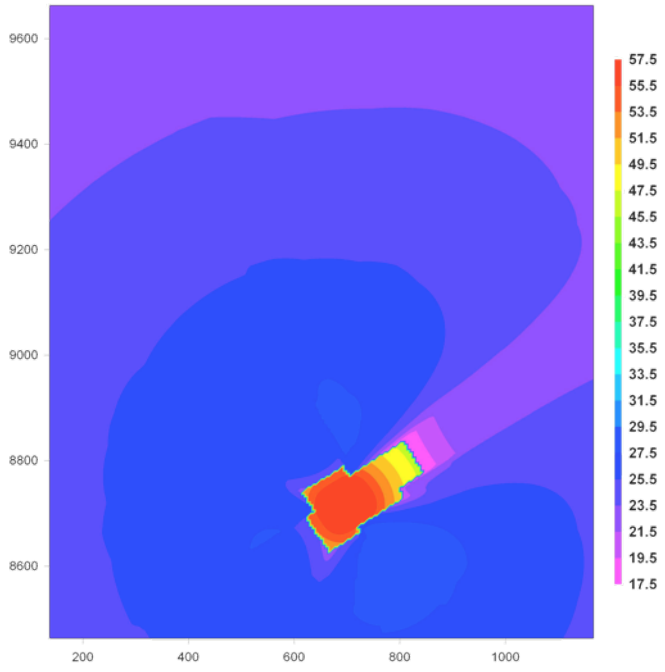
IS3 PROGRAM INPUT DECK - (C) 2009 INVESTIGATIVE SCIENCE & ENGINEERING INC.
GLOBAL VARIABLE DECLARATION
   PROBLEM STATEMENT: RAMONA LIBRARY HVAC NOISE
   STARTING POINT (XY IN FEET): 137,8463
   ENDING POINT (XY IN FEET): 1168,9663
   ANALYSIS FREQUENCY (HZ): 1000
   REFERENCE DISTANCE FOR SOUND (D IN FEET): 3
   SOUND PROPAGATION COEFF XLOG10: 20
   EXCESS ATTENUATION (DB): 0
   COMPUTATIONAL STEP DISTANCE (IN FEET): 5
   RECEPTOR ELEVATION (IN FEET): 5
ACOUSTIC SOURCE DECLARATION (XYZ - SOUND LEVEL - LABEL)
   NUMBER OF SOURCE POINTS: 4
   665,8720,32,75,5T HVAC UNIT
   709,8747,32,75,5T HVAC UNIT
   685,8685,32,75,5T HVAC UNIT
   731,8714,32,75,5T HVAC UNIT
BARRIER SEGMENT DECLARATION (START XY - END XY - HEIGHT - STC - LABEL)
   NUMBER OF BARRIER PAIRS: 12
   667,8627,726,8664,35,0,LIBRARY STRUCTURE
   726,8664,718,8674,35,0,LIBRARY STRUCTURE
   718,8674,808,8729,35,0,LIBRARY STRUCTURE
   808,8729,798,8747,35,0,LIBRARY STRUCTURE
   798,8747,845,8777,35,0,LIBRARY STRUCTURE
   845,8777,807,8837,35,0,LIBRARY STRUCTURE
   807,8837,704,8771,35,0,LIBRARY STRUCTURE
   704,8771,693,8789,35,0,LIBRARY STRUCTURE
   693,8789,615,8741,35,0,LIBRARY STRUCTURE
   615,8741,639,8704,35,0,LIBRARY STRUCTURE
   639,8704,623,8691,35,0,LIBRARY STRUCTURE
   623,8691,667,8626,35,0,LIBRARY STRUCTURE
DISCRETE RECEPTOR POINT DECLARATION (XYZ - LABEL)
   NUMBER OF DISCRETE RECEPTORS: 0
   0,0,0,NOPOINT
END OF INPUT FILE - REV 4.0
```



INDEX OF IMPORTANT TERMS